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DERIVATION OF CAPACITIES FOR DISPERSED RECREATION ACTIVITIES BY RECREATION OPPORTUNITY SPECTRUM CLASS FOR LAND AND RESOURCE MANAGEMENT PLANNING ON THE CHATTAHOOCHEE – OCONEE NATIONAL FORESTS.

Professional Development
for Outdoor Recreation Management
Clemson University
September 15 – October 3, 1980

by

REESE S. SCULL
District Ranger

Tallulah Ranger District
Chattahoochee – Oconee National Forests
Southern Region
U.S.D.A. Forest Service

February 1981

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ABSTRACT

The Chattahoochee-Oconee National Forests in Georgia contain over 850 thousand acres of national forest land and are located in close proximity to approximately 8.5 million people.

The forests' planning staff is in the process of developing a comprehensive Land and Resource Management Plan which will, ideally, interrelate the various resources available on the two forests.

In order for the plan to be effective, a means must be developed for identifying and measuring the supply and demand situation for each resource.

One of the resources is outdoor recreation, and planning regulations call for providing a broad spectrum of recreation opportunities to meet public needs.

This project deals with identifying and measuring the supply situation for dispersed recreation which comprises the greatest proportion of all uses on the two forests.

This is accomplished through various steps involving the application of the recreation opportunity spectrum (ROS) concept which is incorporated in the draft Recreation Planning Handbook (FSH 2309.13). The handbook provides guidance for directing recreation opportunity planning for the Land and Resource Management Planning process.

The ROS concept considers the relationship of recreation activities and the settings where those activities can take place. It is a continuum along which combinations of recreational activities, settings and opportunities can be arranged.

The continuum is divided into six classes. Determination of ROS classes has not been completed on the two forests. Presently, it appears that four classes will be applicable. They are as follows:

SPNM (Semi-primitive non-motorized)

SPM (Semi-primitive motorized)

RNA (Roaded Natural)

RURAL (Rural)

Specifically, this project deals with the derivation of capacities, supply, for each of the four ROS classes on the Chattahoochee-Oconee National Forests.

Dispersed recreation capacities for each ROS class when aggregated will result in a recreation visitor day per acre (RVD/acre) "capacity coefficient" which can be used in comparing recreation supply with demand and for Land and Resource Management Planning monitoring and evaluation.

INTRODUCTION

SITUATION

There are two national forests in Georgia: The Chattahoochee containing 744,811 acres of national forest land in mountainous North Georgia and the Oconee containing 105,813 acres in the rolling piedmont of Middle Georgia.

These two national forests offer over 500 developed campsites, over 200 picnicking sites, two wilderness areas, the Chattooga National Wild and Scenic River, six swimming beaches, thousands of acres of lakes and streams hundreds of miles of trails including the Appalachian National Scenic Trail and five National Recreation Trails; fishing and hunting; twelve special interest areas; and many opportunities for other types of outdoor recreation.

Approximately eight and one-half million people live within a three hour drive of both forests.

In 1960 the National Forest Recreation Survey identified numerous potential development sites on the Chattahoochee - Oconee Forests. The Forest Recreation Plans approved in 1965 provided a development schedule for those sites based on a projected need, but actual campground use in the late 1960's and early 1970's indicated that use of developed recreation sites was much less than that projected.

Due in part to a Nationwide surge in environmental awareness in the late 1960's, recreation use in undeveloped areas began to rise sharply, far surpassing the increase in areas where facilities were provided. Casual observation on the Forests confirmed that family camping had reached capacity on most weekends during the summer use

season. Increases in weekend leisure time have acted to extend the use season.

Presently, dispersed recreation comprises the greatest proportion of all use on the Chattahoochee - Oconee National Forests. The effects of this use in increased littering along roadways and vandalism damage have required control in some areas to reduce the adverse effect on public safety and health. Other areas such as the Appalachian Trail and parts of the Cohutta Wilderness are receiving concentrated use which not only diminishes the experience sought by the user, but is adversely impacting natural resources.

In 1974, Congress passed the Forest and Rangeland Renewable Resources Planning Act (RPA). RPA directed the Secretary of Agriculture to periodically assess the Nation's forest and rangeland resources and to submit, at regular intervals, recommended long range Forest programs.

In 1975 the first program was submitted. It recommended increasing the supply of outdoor recreation opportunities and services though Forest Service Programs that emphasize dispersed recreation. Under this program dispersed recreation would increase in the next two decades. The program also calls for the Forest Service to maintain its share of developed recreation.

In meeting it's outdoor recreation responsibilities, the Forest Service is directed to coordinate with the private sector and other government entities at the Federal, State and local level to ensure programs are complimentary and to avoid duplication of efforts.

ASSUMPTIONS

The demand for dispersed recreation will increase faster than the demand for developed recreation on the Chattahoochee - Oconee National Forests. Simultaneously, restraints caused by increased travel costs and reduced money available for recreation pursuits will likely shorten travel distances and increase destination use on the Chattahoochee - Oconee.

Although the demand for developed sites will increase, financing for recreation development will continue to be low resulting in only a slight increase in use of Forest Service facilities. Private recreation development will most likely supply some of the demand and is expected to increase. Developers should be encouraged to provide facilities with more amenities than those available on the two National Forests. Continued cooperation with Area Planning and Development Commissions and other Federal, State and local agencies remains essential.

PROBLEM

The National Forest Management Act of 1976 and subsequent implementing regulations specify procedures for integrating all resources on a National Forest into a comprehensive Land and Resource Management Plan. In 1980, the Chattahoochee - Oconee National Forests began developing their plan. The plan will, ideally, interrelate the various resources and uses available on the Chattahoochee - Oconee and provide for balancing the supply and demand for each.

Regulations (36 CFR 219.12i) call for the integrated management of public lands to provide and enhance a broad spectrum of recreation opportunities to meet public needs.

In order for the plan to be effective a means must be developed for identifying and measuring the supply and demand situation for each resource. This procedure must facilitate comparisons and evaluations with competitive and alternative resources and uses.

PURPOSE

The primary objective of this project is to derive per acre capacities for dispersed recreation activities by Recreation Opportunity Spectrum (ROS) Class.

Once derived the per acre capacities will be aggregated resulting in a per acre "capacity coefficient" by ROS class which can be used in the Land and Resource Management Planning trade off analysis to register what kinds and amounts of dispersed recreation opportunities are being allocated or traded off through the various alternatives.

This project does not deal with capacity derivations for developed recreation sites or facilities.

LITERATURE REVIEW

Recreation carrying capacity is a complex and troublesome concept that incorporates principles of the social as well as the physical and biological sciences. There is no magic number that is the capacity for a given recreation site. Deciding how much and what kind of recreation use is acceptable for an area must be based on managerial judgment and experience. (Lime, 1976)

The effects of human numbers on recreation were recognized early in Europe. As early as 868, severe fines were imposed on poachers who hunted on forest land reserved for the nobility during Charlemagne's reign. (Wagar, 1963)

Carrying capacity has been discussed in the literature since the 1930's (Lime, 1976). Since the development of the automobile and more specifically since the end of WWII, outdoor recreation has increased tremendously in the United States. Managers of outdoor recreation areas face the problems of defining, augmenting, and understanding the carrying capacity of outdoor recreation lands. (Wagar, 1963)

In spite of the growth in literature, Lime contends that little change has occurred in the basic conceptual framework for carrying capacity since the first definitive writings on the subject in the late 1950's and early 1960's in which the author stressed that carrying capacity considerations must recognize both the durability of the environment to sustain use and the ability of the site to produce a continuing flow of satisfaction and benefits to users. (Lime, 1976)

In 1971, Lime and Stankey set forth three basic interrelated components of carrying capacity:

1) Management objectives, 2) Visitor attitudes, and 3) Recreational impact on the physical resources. Discussion of the three components follows:

1) Management objectives

> Management objectives must define what type of recreational opportunities the area is going to provide.

Wagar states that, in every case involving carrying capacity, there must be implied, if not stated, a management objective (Wagar, 1963).

In setting management objectives, the physical resources of the area and the attitudes of the users must be considered (Lime and Stankey, (1971). In the Southern Appalachians it is imperative that managers develop a balanced system or spectrum of recreation opportunities in setting management objectives and standards. No one manager or agency need feel obligated to meet the demands of all recreation users. (Lime, 1976)

It is also the manager's task to determine limits of acceptable change, for use will produce sociological as well as biological change. He must realize that change is undesirable only when it conflicts with management objectives. (Stankey, 1977)

2) Visitor attitudes

> Visitor attitudes are valuable in formulating decisions although the manager cannot solely rely on them. (Lime and Stankey, 1971)

Managers face a problem in establishing the appropriate mix of diverse recreational opportunities which they might develop, and it is here that managers need recreationists' input to make valuable management decisions. By ensuring that a full range of opportunities exists, managers will be in a better position to match user needs with

opportunities, rather than by trying to develop recreation areas on what they, the managers, think the users needs are. (Lime and Stankey, 1971)

3) Recreational impact on physical resources

Managers needs to know:

(1) The character of change that will occur under specific levels and types of recreation use.

(2) How the predicted change in the physical environment relates to the management objectives of the area. (Lime and Stankey, 1971)

Public land managing agencies have received a mandate, through the Nationwide Outdoor Recreation Plan (BOR., 1973) to determine specific carrying capacities for their areas and to manage them with that thought in mind. This committment requires that:

"Each Federal recreation land managing agency will determine the carrying capacity of its recreation lands, considering management objectives, ecological concerns, and user characteristics. As a second step, each Federal land managing agency will institute necessary controls and develop new ways of managing the movement of people to ensure that use does not exceed capacity." (Lime, 1976)

One way to reduce adverse impacts on visitor enjoyment and physical resources is to provide minimum spacing requirements. (Lime and Stankey, 1971)

Through experience more and more guides are being developed for space requirements for recreationists. For example, the U. S. Forest Service (1957) has used 100 feet as a standard minimum distance between camping units in developed campgrounds. (Wagar, 1963)

In 1967, an array of spacing standards for various recreational activities was published by the U. S. Department of the Interior.

(Department of the Interior, 1967)

In 1975, a study concerning Optimum Recreation Carrying Capacity was carried out for the Bureau of Outdoor Recreation. The resulting spacing guidelines were provided for use by planners and administrators in determining optimum carrying capacities for particular recreation activities under specific physical and social circumstances.

Optimum carrying capacity is defined as a level at which a recreation resource can be used to protect the resource and preserve people's enjoyment of the resource. Primitive camping, primitive and general hiking, boat and shoreline fishing, big game and small game hunting, picnicking and swimming were some of the recreational activities studied (Urban Research and Development Corporation, 1977).

A 1975 report offers guidelines for campsite spacing in roadless areas to achieve varying degrees of insulation from different types of noises between camping parties. Campsite location relative to other campsites is more important to the visitor's experience than is the campsite location relative to trails. (Dailey and Redman, 1975)

Other sources of literature contain much information which can be used in determining the carrying capacity.

A project involving motor vehicle sampling and interviewing passengers to calibrate and forecast travel patterns of recreation users on the Chattahoochee National Forest was carried out in 1972. (Field Implementation of TSPP, 1972)

The July, 1980, draft of the Recreation Planning Handbook serves as a guide in directing Recreation Planning for the Land and Resource Management Planning Process. The Recreation Opportunity Spectrum (ROS) is incorporated as the basic framework for Recreation Resource Planning.

Chapter twenty deals with the supply, capacity, component of Recreation Opportunity Planning including capacity determination as expressed in capacity coefficients. (FSH 2309.12, 1980)

Part of the Recreation Information Management (RIM) Handbook depicts standard recreation activity codes which are used thoughout the U. S. Forest Service in reporting recreation use (FSH 2309.11, 1980).

A computer GRID data base stores, by 18 acre rectangular cells, much valuable information which can be used in Recreation opportunity planning including the following: 0-10% slope class; miles of national forest controlled shoreline on lakes; miles of better than primitive roads on national forest land; physical setting; and present land use as effects ROS. (University of Georgia, 1980)

A U. S. Forest Service Region Eight Memorandum contains average R-8 Recreation activity duration figures depicted in hours and tenths. (2310 RIM Recreation Activity Durations, 10/6/80)

Five-year wildlife management plans prepared in 1980 by Game and Fish Biologists, Georgia Department of Natural Resources, contain much information regarding hunting and fishing opportunities on cooperative wildlife management areas on the Chattahoochee - Oconee National Forests. The plans were prepared at the request of the Forest Supervisor for use in the Land and Resource Management Planning Process. (CARLOCK et, al., 1980)

A paper dealing with the determination of present recreation visitor day (RVD) use attributed to big game, turkey, and small game hunting on the Chattahoochee and Oconee National Forests was prepared by two University of Georgia Coop. students. (Hillard and Bronk, 1981)

A brief paper listing desired, optimum population levels of both consumptive and non-consumptive wildlife species was prepared by the

Forests' Wildlife Staff Officer. (Richards, 1980)

A paper dealing with inadequate deer harvest as related to vehicular access within nine wildlife management areas in the Chattahoochee National Forest was prepared by the Game and Fish Division, Georgia Department of Natural Resources. (Kammermeyer, 1980)

Estimates of total length of primary and secondary trout streams on the Chattahoochee National Forest were calculated by the Georgia Department of Natural Resources. (England, 1980)

Data concerning native brook trout management including average width of native streams in three northeast Georgia counties is contained in a 1979 Georgia Department of Natural Resources publication. (England, 1979)

From 1962 through 1964, creel census data was taken from fisherman fishing stocked trout streams on seven cooperative wildlife management areas and 15 streams off cooperative areas on the Chattahoochee National Forests (Hastings, 1965).

An enclosure to a Region Eight Fisheries Biologists memorandum discusses management standards and carrying capacities for the Appalachian Mountains, expressed in mandays per acre of water per year for trout streams, ponds and warm water fisheries. (Seehorn, 2620 Planning, 10/28/80)

Another Region 8 memorandum includes data pertaining to stream and lake resources on the Chattahoochee Oconee National Forests. (Bryan, 2640 Stocking and Harvesting, 3/6/80)

METHODOLOGY

The derivation of capacities indicating maximum dispersed recreation supply by Recreation Opportunity Spectrum (ROS) class involves several stages of development.

As a matter of explanation, Recreation Opportunity Spectrum is a continuum or spectrum along which combinations of recreational activities, settings and experience opportunities can be arranged.

The continuum is divided into six classes ranging from primitive to urban. (FSH 2309.13, 1980)

Recreation activities in given settings provide opportunities for the user to achieve desired experiences (FSH 2309.13, 1980). Therefore, settings and those activities which are needed and can be appropriately provided for on the Chattahoochee - Oconee National Forests must first be identified.

Settings on the Forests are being identified through application of the Recreation Opportunity Spectrum Framework. (FSH 2309.13, 1980)

Using remoteness criteria the possibility of any primitive ROS class was eliminated. Moreover, by applying other ROS criteria the possibility of any significant amount of urban class was eliminated.

Identification of other ROS classes is being accomplished utilizing the computerized Grid data base at the University of Georgia.

Although the basic ROS framework is being followed, some aspects of considering the social and managerial setting are not included because of limitations in the Grid data base. Physical setting, evidence

of humans and present land use as affects Recreation are its' principal components.

Resulting maps will be analyzed and adjusted for accuracy.

At this state in the process it appears that four ROS Classes will be identified on the forests. They are semi-primitive non-motorized (SPNM), semi-primitive motorized (SPM), roaded natural (RNA), and rural.

Appropriate activities identified by ROS Class are shown in attachment "A" on page 13. Appropriate means that the opportunities for those activities fall within the range of probable experiences associated with a given ROS Class.

ATTACHMENT A.

Recreation Activity Opportunities By ROS Classes	SPNM	SPM	RNA	RURAL
Viewing Outstanding Scenery		X	X	X
Hiking	X	X	X	X
Horse Back Riding	X	X	X	X
Swimming		X	X	
Fishing	X	X	X	X
Camping	X	X	X	X
Hunting	X	X	X	X
Nature Study	X	X	X	X
Acquired General Knowledge/ Understanding	X	X	X	X
Unguided Hiking				X
General Information	X	X	X	X
ORV Touring		X	X	X
Auto-Touring			X	X
Picnicking	X	X	X	X
Enjoying Unique and Unusual Environments	X	X		

SPNM, semi-primitive non-motorized.

SPM, semi-primitive motorized.

RNA, roaded natural

Rural

These opportunities are likely to occur on the Chattahoochee - Oconee National Forests and were selected from those listed in the Recreation Planning Handbook. (FSH 2309.13, 1980)

Since the Forests have very little specific data regarding what probable experiences the recreating public desires, the activity opportunities in table one were identified by the Forests' Recreation Staff Officer based on experience, intuitive judgement, and on the capability of the resource to sustain the impact of those activities. (Robert Harper, personal communication, 1981)

Through analyzing the activity opportunities identified in table one and reviewing Recreation Information Management (RIM) data activity use figures it was determined that a limited number of activities would account for approximately 75 to 85% of dispersed use in the four ROS classes. (Robert Harper, personal communication, 1981)
Those activities by ROS class follow:

	RECREATION ACTIVITY				
ROS Class	Hiking	Fishing	Camping	Hunting	Auto Touring
SPNM	X	X	X	X	
SPM	X	X	X	X	
RNA	X	X	X	X	X
Rural	X	X	X	X	X

Identification of activity and setting opportunities sets the stage for deriving capacities for the four ROS classes.

Recreation capacity is defined as a measure, by ROS class, of the maximum number of people who can obtain given kinds of recreation experiences on each of the two forests within the constraints of resource capabilities. (FSH 2309.13, 1980)

Capacity can be viewed in two ways. One, "theoretical maximum capacity" represents a figure based upon each acre of the two forests being at its upper physical or social capacity limit.

The second view is that while the "theoretical maximum capacity" may provide a theoretical upper limit, it very seldom represents a realistic or "practical maximum" capacity because it does not take into consideration factors such as weekday versus weekend use, durations of recreation activities, season lengths, etc.

Practical maximum capacities expressed in RVD/acre can be derived for the five activities which account for most of the use in the Forests' four ROS classes. Once this is completed a per cent factor can be added to cover the additional activities.

In some activities (hiking, camping, auto touring) theoretical maximum capacity is first derived and the results (PAOT/acre) used in deriving practical maximum capacity (RVD/acre).

In others (fishing, hunting), practical maximum capacity expressed in RVD/acre is directly derived.

Analyses for determining practical maximum capacities for the five activities follow.

TRAIL HIKING

1. Theoretical Maximum Carrying Capacity.

A. Computations

$$C = \frac{(P \div M)\ (m)}{a}$$

C = PAOT/acre for trail hikers in a specific ROS class

P = Number of people per hiking group

M = Spacing in miles between groups

m = Average number of miles of developed and undeveloped trails per thousand acres in a specific ROS class

a = 1000 acres

EXAMPLE: Compute PAOT/acre for trail hiking in a semi-primitive non-motorized ROS class where P = 2.5, M = 0.8 miles, m = 2.5 miles

$$C = \frac{(2.5 \text{ people/group} \div 0.8 \text{ miles between groups}) \cdot (2.5 \text{ miles trail}/1000 \text{ acres})}{1000 \text{ acres}}$$

C = .0078 PAOT/acre

PAOT/acre theoretical maximum carrying capacity for trail hiking can be computed in the same manner for other ROS classes on the two forests. PAOT means persons at one time.

B. Information

Manually plotting of developed and undeveloped hiking trails on several sample ROS areas resulted in assessing 2.5 miles of trail per thousand acres of land to the SPNM ROS class and 2.0 miles of trails per thousand acres of land to the other three classes. Trail hiking which is a day use activity occurs in all four ROS classes on the Chattahoochee - Oconee National Forests.

The following display illustrates data used in developing hiking capacity by ROS class:

ROS Class	People/ Group	Maximum No. of Group sighted	Hiker Speed MPH	Hiking Duration per Group/Day (hrs)	Distance Between Groups
SPNM	2.5	15	2.5	6	0.8 mi
SPM	2.5	20	2.0	6	0.6 mi
RNA	4 3 mc-o	30	1.5	2*	0.10 mi
Rural	4	90	1	2*	117 feet

*Multiply by 4 to get a total of 8 hours duration per day for shorter hikes.

People/Group

A 1977 BOR Study revealed that many primitive hikers travel in groups of 2 or 3 (Average 2.5, Urban Research and Development Corporation, 1977).

The more primitive hiking will occur in SPNM and SPM Classes. Due to accessibility and shorter hikes, groups hiking in RNA and Rural areas will average more than 2.5 per group. A traffic survey indicates an average of 4 people per vehicle (Field Implementation of TSPP, 1972). Since most of the use will be two hour stops by these people, we use four people per hiking group.

Maximum Number of Groups Sighted

Applying user density criteria in the draft Recreation Planning Handbook no more than fifteen parties per day should be encountered in trails in the SPNM ROS Class. (FSH 2309.13, 1980)

Frequency of contact should be low to moderate on trails in SPM Areas and increasing due to accessibility and shorter hikes in RNA and Rural Classes. Assumption: As many groups are hiking in one direction as the other. Some of the groups hiking in the same direction will overtake others.

Hiker Speed

Primitive hikers walk at speeds of two to three mph (Average 2.5 mph). General "walkers"; i.e. those hiking short distances for pleasure or for

nature appreciation walk at speeds averaging one mph (Urban Research and Devlopment Corporation, 1977). Assume hiker speeds of 2.5 mph in SPNM, 2.0 mph in SPM; 1.5 mph in RNA and 1 mph in Rural ROS Classes.

Hiking Duration

The length of time that hiking groups are on the trail is extremely variable, but it is typical that duration of hiking in more remote areas will be longer than in rural areas. Based on general knowledge, one can assume that on a long trek a backpacker or avid hiker will hike an average of fifteen miles a day (six hours x 2.5 miles per hour) whereas, the "walker" will hike shorter distances at slower speeds. Assume a two hour duration for general hikers or walkers.

Distance between Groups

Spacing between groups is dependent upon the degree of privacy desired by the hiking group; hiking speed; and the duration of the hike. (Urban Research and Development Corporation, 1977).

EXAMPLE: Semi-primitive non-motorized ROS class.

6 hour duration x 2.5 mph = 15 miles hiked/day
Assume 15 sightings per day.
3 mph hikers will cover 18 miles per day.
2 mph hikers will cover 12 miles per day.
Assume one-half of the hikers at each speed 1/3 of contacts will be from overtaking some groups going same direction.
Assume 1/2 of hikers will be traveling each way.

Therefore:

15 sightings = 1/3 x +1/2x
x = total number of groups.
15 = .8x
x = 19 groups

Average number miles of trail hiked per day ÷ #groups = spacing between groups.

15 miles divided by 19 = 0.8 miles between groups.

Since specific user criteria is non-existent for each of the other three ROS classes, differences in hiking speed were not considered in assigning spacing between groups.

The following computations were made to determine spacing.

$$\text{Spacing} = \frac{\text{Hiker speed x Duration}}{\text{Maximum number of groups sighted.}}$$

EXAMPLE: Semi-primitive motorized

$$\text{Spacing} = \frac{2.0 \text{ mph x } 6 \text{ hours}}{20 \text{ groups}}$$

Spacing = 0.6 miles between groups.

2. Practical Maximum Carrying Capacity.

Adjust theoretical maximum to practical maximum carrying capacity expressed in RVD/acre.

A. Computations

$$\text{RVD/acre} = \text{PAOT} \times \text{MS} \times \text{PU} \times \frac{\text{LOS}}{12}$$

EXAMPLE: Semi-primitive non-motorized

$$\text{RVD/acre} = .0078 \text{ PAOT/acre} \times 210 \times 0.65 \times \frac{6}{12}$$

RVD/acre = 0.5324 RVD/acre

PAOT = .0078, theoretical maximum carrying capacity

MS = 210 days (season of use)

PU = 0.65, adjustment factor for difference in weekday versus weekend use.

LOS = $\frac{6}{12}$ 6 is duration of hiking in hours.
12, 12 represents one visitor day of 12 hours.

B. Information

Season of Use

Season of use (MS) is expressed in number of days.

There will be a longer season of use in more remote areas.

1. Users are generally seeking a greater challenge than those using other parts of the Forest. This challenge results from weather among other things and will tend to lengthen the season.
2. More planning is needed for remote areas.
3. More effort is required for use of more remote areas. Park vehicle and walk - probably stay longer - takes more planning. (Robert Harper, personal comminication, 1981)

Apply the following seasons:

ROS Class	Length of Season (Days)
SPNM	210
SPM	182
RNA	150
Rural	150

Pattern of Use

Pattern of use (PU) adjustment factors comparing weekday to weekend use are in appendix A.

Weekday will more closely approximate weekend use in the more primitive areas because primitive hikers will make longer hikes and desire more privacy than the casual short distance hiker.

Estimates based on experience by ROS class follow:

ROS Class	Pattern of Use Factor
SPNM	0.65
SPM	0.50
RNA	0.43
Rural	0.43

(Robert Harper, personal communication, 1980)

Length of Stay

Length of stay (LOS) refers to duration of hike in hours.

Refer to display on page 17 for information concerning Hiking Duration.

FISHING - (TROUT FISHING)

Both native and stocked trout fishing are day use activities on the Chattahoochee National Forest. There are no trout fishing resources on the Oconee National Forest.

1. Native Trout Fishing

Native trout streams in the Southern Appalachians can sustain an average of 32.5 angler days of fishing per acre of water per year. Additional fishing pressure will deplete native trout reproduction. (Seehorn, 2620 Planning, 10/28/80).

The general trout fishing season is 215 days long. One angler day constitutes one fishing visit of 4.5 hours. (2310 RIM Recreation Activity Durations, 10/6/80).

Assumption: Native trout streams are equally distributed throughout the Chattahoochee National Forest.

Because the capacity for native trout fishing is so low, there is no need to derive a theoretical maximum capacity (PAOT/acre). A practical maxim capacity expressed in RVD/acre can be computed.

A. Computation

$$\text{RVD/acre} = \frac{(\text{Stream miles} \times \text{acres/mile}) \cdot \left(\frac{\text{Angler days/acre} \times \text{hours/angler}}{\text{One RVD}}\right)}{\text{Total Acres}}$$

EXAMPLE:

$$\text{RVD/acre} = \frac{(1153.7 \times 1.1) \cdot \frac{(32.5 \times 4.5)}{12}}{744,811}$$

$$\text{RVD/acre} = \frac{115,467}{744,811}$$

$$\text{RVD/acre} = .0208$$

.0208 RVD's of native trout fishing per acre of land on the Chattahoochee in all four ROS Classes.

B. Information

Stream Miles

According to a 1980 study completed by Russ England, Georgia Department of Natural Resources Fisheries Biologist, there are 1153.7 miles of native trout streams in the Chattahoochee National Forest. (England, 1980).

Acres/Mile

Native trout streams in the Southern Appalachian Mountains average 9 feet in width. (Monte Seehorn, personal communication, 1980). This figure is confirmed by a 1979 Georgia DNR study of native trout streams in three northeast Georgia counties which revealed that most were less than three meters wide. (England, 1979).

A stream nine feet wide contains 1.1 acres of surface water per mile of stream.

Angler Days/Acre

32.5 fishing visits per one acre of water per year.

Hours/Angler Day

4.5 hours constitutes one fishing visit.

RVD

12 hours.

Acres

744,811 Acres of National Forest land on the Chattahoochee.

2. Stocked Trout Fishing

A. Computations

Compute practical maximum capacity expressed in RVD/acre as follows:

$$\text{RVD/acre} = \left[\frac{A \times B}{(C \times D) \div \frac{E}{12}}\right] \div [\text{RNA} + \text{Rural}]$$

$$\text{RVD/acre} = \left[\frac{.769 \times 571{,}160}{(4.1 \times .786) \div \frac{(4.4)}{12}}\right] \div [\text{RNA} + \text{Rural}]$$

$$\text{RVD/acre} = \left[\frac{439{,}222}{3.22 \div .367}\right] \div [\text{RNA} + \text{Rural}]$$

$$\text{RVD/acre} = \frac{50{,}082}{\text{RNA} + \text{Rural}}$$

RVD/acre = RVD's of stocked trout fishing per acre of land in RNA and Rural ROS Classes on the Chattahoochee National Forest.

A = .769 or 76.9% of stocked trout recovered.

B = 571,160 trout stocked.

C = 4.1 trout caught per angler day.

D = .786 or 78.6% of anglers were successful.

E = 4.4 hours per angler day

12 = 12 hours or 1 RVD.

RNA = Total acres in roaded natural ROS class.

Rural = Total acres in rural ROS class.

B. Information

1. Trout stocked - 571,160

a. According to information derived from a 1980 Georgia DNR study, there are 315.1 miles of stocked trout streams in the Chattahoochee National Forest. (England, 1980). The average acreage of surface water per fishable length of stocked streams is 1.6 acres/mile. See Table 1 on page 25. An optimum level of stocking from the physical resource standpoint (streambank vegetation, streambank compaction, siltation, etc.) is about 1000 catchable fish per acre of water distributed over the 215 day trout fishing season. (Russ England, personal communication, 1980). In addition to streams, 67 acres of impoundments are stocked with catchable trout. Impoundments are Consauga,

TABLE 1

Determination of average acres per mile for stocked trout streams on the Chattahoochee based on sample stream survey (no date).

County	Stream	Fishable length miles	Acreage
Lumpkin	Boggs Creek	4.6	6.8
Lumpkin	Etolah River	4.6	7.1
Lumpkin	W. Fk. Montgomery	3.6	4.3
Lumpkin	Cane Creek	1.9	1.8
Union	Cooper Creek	22.7	34.0
Union	W. Fk. Wolf Creek	2.1	2.0
White	Chattahoochee*	1.0	3.6
Habersham	Panther Creek	19.5	33.1
Towns	Corbin Creek	3.7	3.9
Gilmer	Mtn. Town Creek	9.0	10.9
Rabun	Tallulah River	4.4	16.0
Rabun	Dick's Creek	5.0	7.3
Rabun	Sarah's Creek	5.0	6.7
Rabun	Holcombe Creek	9.4	15.0
	TOTAL:	96.5	152.5

$$\frac{152.5 \text{ acres}}{96.5 \text{ miles}} = 1.6 \text{ acres/mile}$$

Average width 13.2'

*(Doug Watson, personal communication, 1980)

Murray, Dockery, Rock Creek, Nancytown and Winfield Scott.

b. Computations to determine optimum number of trout to stock.

Compute practical maximum capacity in RVD's

stream miles x acres/mile = impoundment acres

x 1000 fish/acre = fish stocked.

315.1 mi x 1.6 acres/mile = 67 acres x 1000

fish/acre = 571,160 fish stocked per season.

Trout stocked on the Chattahoochee in 1980

numbered 429,000 catchable and 50,000 finger-

lings. (Rich Fatora, personal communication, 1980).

2. The following is a summary of creel census data taken on Chattahoochee National Forest Wildlife Management Areas in 1962, 1963, and 1964. (Hastings, 1964, 1965)

Subject	1962	1963	1964	$\bar{X}$
*% Stocked Trout Recovered	75.0	76.7	78.9	76.9
Average catch/angler day	4.2	4.1	4.0	4.1
Average hours/angler day	4.5	4.6	4.2	4.4
*% of successful anglers	78.8	79.6	77.5	78.6

*Percentages expressed as decimals in computations. Ex. 76.9% expressed at .769.

All trout are stocked by trucks traveling on better than primitive roads; therefore, stocked trout fishing will take place in the RNA and Rural ROS Classes.

FISHING - (WARM WATER STREAM FISHING)

Warm water fishing streams on the two National Forests are not intensively managed and can support between 10 and 15 mandays of fishing per acre of water per year. Additional fishing pressure would deplete the standing crop of game fish. (Seehorn, 2620 Planning, 10/28/80)

Because optimum fishing capacity is so low there is no need to derive a theoretical maximum capacity (PAOT/acre). A practical maximum expressed in RVD/acre can be computed.

1. Computations:

$$\text{RVD/acre} = \frac{(\text{Acres of streams}) \cdot \frac{\text{Angler days/acre} \times \text{hr/ang/day}}{1 \text{ RVD}}}{\text{RNA} + \text{Rural}}$$

EXAMPLE: Warmwater stream fishing on the Chattahoochee.

$$\text{RVD/acre} = \frac{(90.9) \cdot \frac{12.5 \times 4.4}{12}}{\text{RNA} + \text{Rural}}$$

$$\text{RVD/acre} = \frac{416.62}{\text{RNA} + \text{Rural}}$$ = RVD's of warmwater stream fishing per acre of land on the Chattahoochee National Forest in the RNA and Rural ROS classes.

2. Information

Acres of Streams

These are an estimated 50 miles of warm water fishing streams on the Chattahoochee and the average width is 15 feet. Streams on the Oconee average 25 feet in width. (Elmer Richards, personal communication, 1981) These are 75 miles of warmwater fishing streams on the Oconee. (Bryan, 2640 Stocking and Harvesting, 3/6/80).

EXAMPLE:

$$\text{Stream Acres} = \frac{50 \text{ mi} \times 5{,}280' \times 15'}{43{,}560 \text{ sq ft/acre}}$$

Stream Acres = 90.9

There are 90.9 acres of fishable warmwater streams on the Chattahoochee and 227.3 acres on the Oconee.

Angler Days/Acre

Appalachian bass streams must be intensively managed to support a fishing use of 20 angler days/acre/year. (Seehorn, 2620 Planning Memo, 10/28/80) Warm water fishing streams in the Chattahoochee - Oconee aren't intensively managed. Estimate use at 10-15 angler days/acre. (Elmer Richards, personal communication, 1981). Use 12.5 angler days/acre/year.

Hours per Angler Day

Four point four (4.4) hours constitutes one warmwater stream fishing trip per angler. (2310 RIM Recreation Activity Durations, 10/6/80)

1 RVD

12 hours represents one recreation visitor day.

RNA + RURAL

Total acres in roaded natural and rural ROS Classes.

Most warmwater fishing streams in the two National Forests are within ½ mile of better than primitive roads. Also, warmwater fisherman generally carry enough paraphernalia to make treks longer than ½ mile undesirable.

WARMWATER LAKE FISHING

According to Appalachian Management Standards, warm water lakes on the Chattahoochee Forest will support an average 16.5 angler days per acre of water per year. (Seehorn, 2620 Planning, 10/28/80).

Compute practical maxim warmwater lake fishing in RVD/acre.

1. Computations:

$$\text{RVD/acre} = \frac{(\text{NF acres of lake}) \cdot (\text{Angler days/acre/yr} \times \frac{\text{hrs/ang day}}{12})}{\text{RNA + RURAL ACRES}}$$

EXAMPLE: Warmwater lake fishing on the Oconee.

$$\text{RVD/acre} = \frac{(1812.5 \text{ acres}) \cdot (16.5 \times \frac{4.4}{12})}{\text{RNA + RURAL}}$$

$$\text{RVD/acre} = \frac{10965.6 \text{ RVDS/year}}{\text{RNA + RURAL ACRES}}$$

2. Information:

A. National Forest acres of lake:

With the exception of Lake Russell (90 acres), the Forest Service has no real management control over warmwater lakes within the boundaries of the Chattahoochee – Oconee. However, the Forest Service does own part of the shorelines of the other lakes.

Acres of Lakes

Determine National Forest acreage of lake fisheries resource using percentage of shoreline (Bryan, 2640 Stocking and Harvesting, 3/6/80).

NATIONAL FOREST LAKE ACREAGE

NF	Lake	B. Surface Acres	C. Total Mi Shore	D. NF Mi Shore	NF Acres $\frac{D \times B}{C}$
Chatt	Russell	90	N/A	N/A	90.0
Chatt	Blue Ridge	3290	64	51.0	2621.7
Chatt	Nottely	4181	106	27.19	1072.9
Chatt	Chatuge	6950	132	3.53	185.9
Chatt	Rabun	834	25	1.65	55.0
Chatt	Tugaloo	597	18	0.6	19.9
Oconee	Sinclair	15,300	417	0.34	12.5
Oconee	Oconee	19,160	N/A	N/A	1800

Total National Forest lake fisheries on Chattahoochee = 4045.4 acres.
Total National Forest lake fisheries on Oconee = 1812.5 acres.

GRID data base information (University of Georgia, 1980) was used in calculating National Forest shoreline on lakes for which information was not available. (Russell Lafayette, personal communication, 1981).

Hours per Angler Day

4.4 hours per visit per angler. (2310 RIM Recreation Activity Durations, 10/16/80).

12

one RVD = 12 hours.

RNA + RURAL

Total acres in Roaded Natural and Rural acres. Some lakes have a lot of private developments within 200 feet of shoreline and all lakes have motorized boating use. Assume warmwater lake fishing is distributed in RNA and Rural ROS classes on each forest.

CAMPING

1. Theoretical Maximum Carrying Capacity.

A. Computations

$$C = \frac{(P \times \frac{A}{a})}{M}$$

C = PAOT/acre for campers in a specific ROS class.

P = Users per campsite

A = Number of acres available for campsites per 1000 acres of National Forest land.

a = Number of acres per campsite in a specific ROS Class.

M = 1000 acres.

EXAMPLE: PAOT for semi-primitive non-motorized ROS Class on the Chattahoochee National Forest.

$$C = \frac{2 \text{ users/site} \times \frac{73.6 \text{ acres/one thousand acres}}{15 \text{ acres/campsite}}}{1000 \text{ acres}}$$

$$C = \frac{9.8}{1000 \text{ acres}}$$

C = .0098 PAOT/acre

B. Information

Users per Campsite

A 1977 BOR study suggested that two users per campsite is appropriate in primitive type camping and 3.8 users per campsite in tent and trailer camping. (Urban Research and Development Corporation, 1977).

Use two per campsite in SPNM and SPM ROS Classes and 3.8 per campsite in RNA and Rural areas. The 3.8 user/campsite closely approximates the average number of people (4) per vehicle as determined in a 1972 traffic survey (Field Implementation of TSPP, 1972).

Number of Acres Available for Campsites per Thousand Acres of National Forest Land.

Most, if not all, campers set up campsites on relatively level land, 0-10% slope. A sampling procedure employing the GRID data base was useful in determining how many acres of land on the Chattahoochee and Oconee were in a 0-10% slope class (University of Georgia, 1980).

Nine data files cover all National Forest land on both Forests. Seven files were sampled. Eighteen acre sample cells were counted according to 5% slope increments. Ex. 0-5%, 6-10%, etc. Total cells in the 0-10% slope class for each data file sample were multiplied by 18 to get acres in 0-10% slope. Total acres in the 0-10% class were derived from samples as follows:

CHATTAHOOCHEE GRID DATA BASE

Data File	% Land 0-10% slope	Acres in 0-10% slope	Acres Samples
Lake Russell	21.33	3006	14,094
Chattooga-Tallulah	5.69	1188	20,862
E. Brasstown	5.04	1332	26,460
W. Brasstown	7.36	1998	27,144
Lake Blue Ridge	8.12	1386	17,082
Cohutta Mtn.	1.27	234	18,450
TOTAL	N/A	9144	124,092

$$\frac{\text{Acres Sampled}}{\text{Acres in 0-10\% slope}} = \frac{\text{Total Chattahoochee Acres}}{X}$$

$$\frac{124{,}092 \text{ acres}}{9144} = \frac{744{,}811 \text{ acres}}{X}$$

X = 54,883 acres in 0-10% slope on Chattahoochee

Since there are 744,811 acres of National Forest Land on the Chattahoochee then:

$\frac{54,883}{744.81}$ = 73.6 acres of 0-10% slope per 1000 acres of land.

OCONEE GRID DATA BASE

Data File	% Land 0-10% Slope	Acres in 0-10% Slope	Acres Sampled
Uncle Remus	4	18	450

$$\frac{\text{Acres Sampled}}{\text{Acres Sampled in 0-10\% slope}} = \frac{\text{Total Oconee Acres}}{X}$$

$$\frac{450}{18} = \frac{105,813}{X}$$

$450X = 1,904,634$

$X = 4,233$ Acres of Oconee in 0-10% slope.

$\frac{4,233}{105,813}$ thousand acres on Oconee = 40.00 acres of 0-10% slope class per 1000 acres of land on the Oconee.

Number of Acres/Campsite

According to the user density criteria in the Recreation Planning Handbook (FSH 2309.13), no more than six parties should be visible from a campsite in the SPNM ROS Class.

In the Chattahoochee and Oconee sounds of man are more detectable over a wider range of settings than are visual sightings. This is due to vegetative screening on the Oconee and a combination of vegetation screening and topographic relief on the Chattahoochee. Vegetation and relief that can completely screen visual contact might only partially reduce sounds because sounds tend to intrude more (Dailey and Redman, 1975).

According to Dailey and Redman, conversation among four people becomes inaudible in a woods environment at a distance of 500 feet; whereas, four people singing in a woods environment can be heard for a distance of 1450 feet before background noises mask their singing. Hills, ridges and other rigid topographic barriers further shorten distances at which noises can be heard. (Dailey and Redman, 1975).

According to a 1977 BOR study, 60% of park administrators interviewed agreed that 15 acres per campsite (808' spacing) was optimum for primitive camping.

Ten acres per campsite (660' spacing) will almost always provide complete visual screening and mask normal conversations on the two forests.

Use 15 acres/site in the SPNM and 10 acres/site and SPM ROS Classes.

One acre per campsite is considered to be the maximum as far as optimum spacing for tent and allocated trailer camping is concerned (Urban Research and Development Corporation, 1977). Use one acre per campsite in Roaded Natural and Rural ROS Classes.

2. Practical Maximum Carrying Capacity

Adjust theoretical maximum to practical maximum carrying capacity expressed in RVD/acre.

A. Computations

$$\text{RVD/acre} = \text{PAOT} \times \text{MS} \times \text{PU} \times \frac{\text{LOS}}{12}$$

EXAMPLE:

SPNM Chattahoochee

$$\text{RVD/acre} = .0098 \text{ PAOT/acre} \times 210 \times 0.65 \times \frac{18}{12}$$

RVD/acre = 2.01 RVD/acre camping in SPNM ROS Class.

PAOT = .0098, theoretical maximum carrying capacity

MS = 210 days, (Season of Use)

PU = 0.65, adjustment factor for differences in weekday versus weekend use.

LOS = $\frac{18}{12}$ 18 hours is duration of camping activity including day use. 12 hours represents one visitor day.

B. Information

Season of Use

The season will be longer in more remote areas.

1. Users are seeking a greater challenge than those using more accessible parts of the forest. This challenge results from weather among other things and will tend to lengthen the season.

2. More planning and effort are required for remote areas. Park vehicle and hike into the areas - probably stay longer.

Apply the following seasons:

ROS Class	MS Length of Season (Days)
SPNM	210
SPM	182
RNA	150
Rural	150

Pattern of Use

Pattern of use adjustment factors (weekday vs. weekend) are in appendix A.

Weekday will more closely approximate weekend use in the more remote areas. Primitive campers will make long hikes to gain the privacy they desire and will probably stay longer.

Apply the following:

ROS Class	PU Pattern of Use Factor
SPNM	0.65
SPM	0.50
RNA	0.43
Rural	0.43

Length of Stay

Length of stay (LOS) refers to the duration of the camping activity. Total time at the campsite includes overnight and general day use. Estimated R-8 activity durations for camping are:

General day - 8.2 hours

Night - 11.8 hours

This represents 20 hours per 24 hour day and appears to be high. This only allows four hours per day for other activities. Use 18 hours for LOS.

HUNTING

Tables 2 and 3 on pages 38 and 39 represent RVD use for big game, turkey and small game hunting on the Chattahoochee and Oconee National Forests. (Hilliard and Bronk, 1981)

Big game refers to deer and bear. Small game refers to grouse, quail, dove, rabbit, squirrel, racoon, etc. The RVD's were derived from Georgia Department of Natural Resources' Wildlife Management Area Plans for FY 81 - FY 85. The plans contain an estimate of present hunting use incurred in each wildlife management area.

Present hunting use figures for big game and turkey were derived by multiplying the number of hunters allowed onto each area times the number of days in the area's season. Resulting values were called user days. In table 4 on page forty, 1985 user days were adjusted to reflect how much use was on Forest Service land in those wildlife management areas which were not wholly on Forest Service land. The small game user days were not derived from an actual count of the hunters but were estimated using data available in the plans.

It was assumed that the use per acre per day on Forest Service land within the wildlife management areas could be related to the use in adjacent Forest Service lands.

An involved step by step process was used in arriving at the RVD's of big game, turkey and small game on the forests as depicted in the tables.

1985 goals for public hunting expressed in user days were also stipulated in the plans (Carlock et.al, 1980). 1985 user day figures represent what Game and Fish Division, Georgia Department of Natural

Consumptive Wildlife Use

TABLE 2

Cleveland National Forest

Counties (only FS land considered)	$ * 1.2 * 1/12		Bear/Deer RVD's non-WMA		$ * 1/12		Bear/Deer RVD's - WMA		$ * 0.9 * 7/12		Turkey RVD's non-WMA		$ * 7/12		Turkey RVD's WMA		$ * 4.6/12		Small Game RVD's - non WMA		$ * 4.6/12		Small Game RVD's - WMA	
Riverside *		36.	40	6	22.	90				22.	57	1.	74					52.	52	90.	60				
Orange *		35.	70		3.	10												50.	52		245				
San Diego **		29.	19	93	24.	11				22.	57	6.	68					52.	52	6	15.	73			
Imperial		35.	70	1	19.	56		5.	25		38.	57	22.	51	1	7.	83	7.	58	1.	31	50.	52	1	43.	10	36.	42		21.	85
Riverside *		35.	70	7	11.	67		21.	05	16	31.	70	22.	57	12.	67		7.	58	29.	50	52.	52	5	10.	32	37.	15	6	15.	51
San Diego		29.	19	16	40.	22		3.	50	11	82.	15	22.	57	1.	17		7.	58		49	32.	52	1	18.	17	24.	15		27.	62
Orange *		35.	70	10	38.	17		3.	50	11	20.	80	22.	57	1.	24		7.	58	4.	61	52.	52		89.	81	37.	57	1	08.	51
Riverside		29.	19	10	61.	84		3.	50	3	11.	23	22.	57		76		7.	58		84	52.	52		76.	68	24.	15	1	16.	40
San Diego		35.	70	30	14.	14		3.	50	7	19.	87	22.	57	10	1.	13	7.	58	5.	74	52.	52	21	21.	28	33.	13	2	30.	04
San Bernardino *		35.	70	32	54.	25		5.	25	10	15.	67	22.	57	28.	67		7.	58	19.	79	52.	52	6	55.	91	35.	21	10	00.	41
Riverside		35.	70	12	52.	36		3.	50	8	52.	84	22.	51	2.	71		7.	58	6.	21	52.	52		57.	25	37.	18	2	51.	81
Riverside *		35.	70	21	06.	94		3.	50	9	18.	65	22.	57	38	9.	39	7.	58	33.	67	52.	52	8	18.	42	34.	03	21	02.	53
San Diego		36.	40	9	53.	84		3.	50	9	70.	38	22.	57	32.	73		7.	58	11.	15	52.	52	6	85.	91	33.	73	11	46.	57
Riverside *		35.	70	5	31.	56		3.	50	3	09.	19	22.	57	11.	11		7.	58	14.	18	52.	52	1	90.	61	32.	10	8	58.	29
Imperial *		35.	70	123	25.	15		21.	09	62	11.	06	22.	57	37.	17		7.	58	5.	57	52.	52	21	08.	68	31.	18	6	61.	13
Riverside		29.	19	7	03.	83		3.	50	3	34.	19	22.	57	5.	06		7.	58		90	52.	52	5	10.	54	24.	15	1	03.	84
San Diego		35.	70	16	80.	35		21.	67	8	21.	85	22.	57	10	8.	58	7.	58	31.	27	52.	52	9	11.	05	34.	88	6	18.	77
San Diego		35.	70	11	55.	91		3.	50	1	12.	15						7.	58		49	52.	52		39.	76	24.	15		64.	62
Overall				129	76.	18				98	10.	22			7	49.	39			168.	79			200	86.	12			28	82.	39

Use Season length

RVD's for [illegible] the forest economy by hunters/day

Consumptive Wildlife Use

TABLE 3

Ocoee National Forest

Counties (only FS land considered)	$ * 3.6 * 7/12	Bear/Deer RVD's non-WMA	$ * 7/12	Bear/Deer RVD's-WMA	$ * 5.4 * 7/12	Turkey RVD non-WMA	*	*	$ * 3.1 * 4.6/12	Small Game RVD's-non WMA	$ * 4.6/12	Small Game RVDs-WMA
Cherokee **	1317.51	1574.56			139.75	980.13			62.81	2066.81		
Polk	1326.51	1876.62	8.17	699.66					62.81	2120.51	22.23	23.17
Bradley	1326.51	1715.55	8.17	2778.98					62.81	1133.11	22.23	112.25
Monroe **	1326.51	352.77							62.81	717.71		
Meigs **	1326.51	112.97							62.81	27.39		
Rhea	1326.51	2847.50			125.95	54.50			62.81	213.54		
Hamilton	1326.51	1500.00.51	8.17	660.33					62.81	2115.13	22.23	213.85
Grand Total		6071.021		~~2943.86~~ 1008.47		1034.63				9180.90		321.22

* Data from Cherokee WMA is included in the Bradley WMA data.

** Hunting occurs on the Ocoee NF but the base figure used is off the WMA unit. The average turkey visits/day-acre on all WMA's on the Chattahoochee having turkey seasons

Table 4

1985 USER DAYS FOR WILDLIFE MANAGEMENT
AREAS ON THE CHATTAHOOCHEE NATIONAL FOREST.

Wildlife Mgmt. Areas	% N.F.	Deer/Bear User Days		Turkey User Days		Small Games User Days	
		Gross	Adjusted	Gross	Adjusted	Gross	Adjusted
John's Mtn.	78	9,000	7,020	500	390	1,350	1,053
Cohutta	76	15,000	11,400	800	608	3,950	3,002
Rich Mtn.	91	6,230	5,669	200	182	2,450	2,230
Blue Ridge	97	19,500	18,915	1,600	1,552	10,600	10,282
Chestatee	97	9,750	9,458	1,000	970	6,575	6,378
Chattahoochee	100	9,000	9,000	920	920	6,150	6,150
Coopers Creek	100	13,282	13,282	1,360	1,360	9,010	9,010
Lake Russell	100	13,280	13,280	680	680	2,250	2,250
Coleman River	100	4,300	4,300	450	450	3,015	3,015
Lake Burton	95	5,100	4,845	575	546	3,440	3,268
Shallow Creek	100	7,425	7,425	760	760	2,250	2,250
Warwoman	100	5,470	5,470	575	575	3,515	3,515
TOTAL		117,339	110,064	9,420	8,993	54,555	52,403

Resources estimates can be accomplished through

1. Increasing game populations to optimum or near optimum levels where warranted through more extensive wildlife habitat manipulation and maintenance.
2. Better utilizing game where harvesting levels are low by encouraging hunters through advertising outlets, changing harvesting strategies, etc.
3. Providing more hunter access where feasible and within management constraints.

Factors can be developed by comparing 1985 total user days with present total user days for big game, turkey and small game hunting on each of the two national forests.

EXAMPLES: CHATTAHOOCHEE NATIONAL FOREST

Twelve wildlife management areas are wholly or partially located on the Chattahoochee National Forest. User days by hunting activity attributed to Forest Service land within those areas follow:

Hunting	1980 User Days	1985 User Days	Factor
Big Game(Deer/Bear)	80,811	110,064	1.362
Turkey	4,404	8,993	2.042
Small Game	12,000	52,403	4.367

See table 4 for derivation of 1985 user day figures. Since 1980 RVD figures were based on Wildlife Management area user days, the factors can be used to determine 1985 RVD's.

	1980 Hunting RVD's	x	Factor	=	1985 Hunting RVD's
Big Game	139,831		1.362		190,450
Turkey	918		2.042		1,875
Small Game	28,172		4.367		123,027

OCONEE NATIONAL FOREST

Cedar Creek Wildlife Management Area is located on the Oconee National Forest. The only change in user days in the plan between 1980 and 1985 was in turkey hunting. Presently, there is no turkey hunting on the W.M.A. but through a stocking program approximately 100 visitor use days on the 22,000 acres of Forest Service land within the wildlife management area is anticipated. 1985 hunting recreation visitor days (RVD's) on the Oconee follow:

Big Game - 61,799

Turkey - 1037 (F.S. Land off W.M.A.) + 100 (W.M.A.)

Small Game - 9,514

BIG GAME

A 1962 study in Alleghany County, Virginia by Giles and Gwynn revealed that hunters carried their deer about 0.6 miles to a vehicle. In Western North Carolina, a 1964 study found that 93.4% of deer were killed within 1800 feet of a road or trail. Where kills were made closer to roads than trails, 76% were within 1200 feet of a road. Stenlund and others report that 90% of all deer harvested in 1942 in the Gogoka Management Area, Superior National Forest were killed 3/4 mile or less from a road or trail and that only a few hunters ventured more than 1/2 mile from the nearest access. (Kammermeyer, 1980)

Since bear hunting is incidental to deer hunting in the two National Forests (Elmer Richards, personal communication, 1980), assume 90% of big game hunting occurs within 1/2 mile of a primitive or better than primitive road. Many hunters have vehicles which allow them to negotiate primitive roads accessing the more remote areas.

EXAMPLE:

Determination of big game hunting capacities by ROS classes for the Chattahoochee National follows:

$$\text{RVD/acre} = \frac{.90 \times 190{,}450 \text{ RVD}}{\text{SPM} + \text{RNA} + \text{RURAL ACRES}}$$

RVD/acre = RVD/acre capacity for big game hunting in three ROS classes.

$$\text{RVD/acre} = \frac{.10 \times 190{,}450 \text{ RVD}}{\text{SPNM Acres}}$$

RVD/acre = RVD/acre capacity for big game hunting in SPNM ROS class.

TURKEY

Seventy-five percent of turkey hunting will occur further than 1/2 mile from better than primitive roads. (Ben Sanders, personal communication, 1980).

EXAMPLE:

Determination of turkey hunting capacities by ROS classes on the Chattahoochee National Forest follows:

$$\text{RVD/acre} = \frac{.75 \times 1{,}875 \text{ RVD}}{\text{SPM} + \text{SPNM Acres}}$$

RVD/acre = RVD/acre capacity for turkey hunting in two ROS classes.

$$RVD = \frac{.25 \times 1,875}{RNA + RURAL\ ACRES}$$

RVD = RVD/Acre capacity for turkey hunting in RNA and Rural class which are within ½ mile of a better than primitive road.

With the exception of turkey hunting which will be confined to the Cedar Creek Wildlife Management Area the same methodology can be applied to the Oconee National Forest in determining hunting capacity.

SMALL GAME

Ninety percent of small game hunting will occur within 1/2 mile of primitive or better than primitive roads. (Elmer Richards, personal contact, 1980)

EXAMPLE:

Determination of small game hunting capacity coefficients by ROS class on the Chattahoochee National Forest.

$$RVD/acre = \frac{.90 \times 123,027\ RVD}{SPM + RNA + RURAL\ ACRES}$$

RVD/acre = RVD/Acre capacity for small game hunting in 3 ROS Classes.

$$RVD/acre = \frac{.10 \times 123,027\ RVD}{SPNM\ ACRES}$$

RVD/acre = RVD/Acre capacity for small game hunting SPNM ROS class

AUTO TOURING (DRIVING FOR PLEASURE)

1. Theoretical Maximum Carrying Capacity

A. Computation

$$C = \frac{M \times R \times A \times P}{RNA + RU}$$

M = 1040 miles of better than primitive road on National Forest

R = 0.843 ratio of recreation automobile traffic to total traffic

A = 2, number of automotive vehicles per mile

P = 4, number of passengers per vehicle

RNA = Total forest service land in roaded natural ROS class

RU = Total forest service in rural ROS class

C = PAOT/Acre for recreational auto touring in roaded natural and rural ROS classes. PAOT means persons at one time.

EXAMPLE:

$$C = \frac{1040 \text{ mi} \times .843 \times 2 \text{ veh/mi} \times 4/\text{people/veh}}{\text{Total RNA Acres} + \text{Total RU Acres}}$$

C = PAOT/Acre

B. Information

Miles of Road (M)

Better than primitive roads are located in the ROS classes, urban, rural and roaded natural. Since the two forests have no areas in the urban ROS class, use on better than primitive roads is relegated to the other two classes.

The total number of 18 acre cells containing better than primitive roads on Forest Service land on both forests as per grid data base is 6,933. (University of Georgia, 1980)

A forest engineer mathematically determined that on the average each cell contained 0.15 miles of road. (Mike Beattie, personal communication, 1981)

6,933 cells x 0.15 miles/cell = 1040 miles

Ratio of Recreation Traffic (R)

A 1972 Forest Transportation Planning Project (TSPP) contained the following information:

> 2,760 of the 3,274 vehicular passengers interviewed indicated that their trip destination was forest recreation oriented. (Field Implementation of TSPP, 1972)
>
> $\frac{2760}{3274} = 0.843$

Number of Vehicles/Mile (A)

The optimum number of vehicles per mile at any given time on better than primitive roads located on national forest lands maintaining a desirable recreation experience is two.

Number of Passengers/Vehicle (P)

The average number of passengers per vehicle surveyed was 4. (Field Implementation of TSPP, 1972)

2. Practical Maximum Carrying Capacity

The theoretical maximum capacity is unrealistic because it assumes a maximum number of auto-touring recreationists each day, 365 days a year, rain or shine. Therefore, it must be adjusted to more accurately

represent the realistic or practical maximum carrying capacity. (FSH 2309.13, 1980)

A. Computations

$$RVD/Acre = PAOT \times MS \times PU \times \frac{LOS}{12}$$

PAOT = PAOT/Acre (Theroretical maximum carrying capacity)

MS = 210 days (Season of Use)

PU = 0.43, factor based on weekday versus weekend use

LOS = $\frac{2.5}{12}$ 12 is constant for 12 hours = 1 RVD
2.5 is duration of activity in hours and tenths

$$RVD/Acre = PAOT \times 210 \text{ days} \times 0.43 \times \frac{2.5}{12}$$

$$RVD/Acre = PAOT \times 18.81$$

B. Information

Season of Use (MS)

Season of use is estimated at 210 days/year and covers the majority of recreation use activities. (Robert Harper, personal communication, 1981)

Pattern of Use (PU)

Pattern of use factors are presented in appendix A. The factors aid in reducing theoretical maximum carrying capacity to "practical capacity" by allowing for the difference in use between weekdays and weekends. (FSH 2309.13, 1980) In this case, recreational automobile use will be five times greater on the weekend than during weekdays. (Robert Harper, personal communications, 1981)

Length of Stay (LOS)

Length of stay refers to the duration of the auto touring activity which is 2.5 hours. (2310 RIM Activity Durations, 10/6/80)

SUMMARY

When the identification of ROS classes on the Chattahoochee - Oconee National Forests is completed, ROS class acreages can be "plugged" into the capacity equations and practical maximum capacities expressed in RVD/acre computed for each of the major dispersed recreation activities within each ROS class.

Once this is completed, a percent factor can be added to cover the additional activities and a resulting capacity coefficient arrived at for each ROS class.

A table such as the one on page 50 can be used for displaying this information.

In item (B) of the table, fifteen point two percent (.152) represents capacity attributed to additional dispersed recreation activities other than those depicted in the table.

All appropriate activities identified by ROS class are depicted in Attachment A on page 13.

Use 19.4% (.194) for computing additional dispersed recreation activities capacity on the Oconee National Forest.

The 15.2% Chattahoochee and 19.4% Oconee factors were derived from fiscal year 1980 RIM use reports. (Robert Harper, personal communication, 1981)

TABLE

DETERMINATION OF CAPACITY COEFFICIENTS FOR THE CHATTAHOOCHEE NATIONAL FOREST

DISPERSED RECREATION ACTIVITIES	ACTIVITY CAPACITIES (RVD/ACRE) BY ROS CLASS			
	SPNM	SPM	RNA	RURAL
Hiking				
Native Trout Fishing				
Stocked Trout Fishing				
Warmwater Stream Fishing				
Warmwater Lake Fishing				
Camping				
Deer/Bear Hunting				
Turkey Hunting				
Small Game Hunting				
Auto Touring				
(A)= Sub-Total				
~~(B)= .152 x (A)~~				
A = .848 ~~(A)+(B)~~ = Cap. Coeff.				

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PERSONAL COMMUNICATION

Robert Harper, Recreation Staff, Chattahoochee-Oconee National Forests.

Elmer Richards, Wildlife Staff, Chattahoochee-Oconee National Forests.

Ben Sanders, Wildlife Biologist, Chattahoochee-Oconee National Forests.

Mike Beattie, Supervisory Civil Engineer, Chattahoochee-Oconee National Forests.

Monte Seehorn, Fisheries Biologist, Regional Office, Region Eight, Forest Service, U.S.D.A.

Russ England, Fisheries Biologist, Division of Game and Fish, Georgia Department of Natural Resources.

Rich Fatora, Fisheries Biologist, Division of Game and Fish, Georgia Department of Natural Resources.

Doug Watson, Wildlife Technician, Chattooga Ranger District, Chattahoochee-Oconee National Forests.

Russell Lafayette, Hydrologist, Chattahoochee-Oconee National Forests.

APPENDIX A

Pattern-of-Use Adjustment Factors

Pattern	Factor
Weekday:Weekend	
1:1	1.00
1:1½	.80
1:2	.65
1:3	.50
1:4	.45
1:5	.43
1:6	.40
1:7	.38
1:8	.37
1:9	.36
1:10	.35